^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 108,2035 (2007)	30-Mar-2007

Parent: ^{252}Cf: E=0.0; $J^{\pi}=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=?

2006Jo05: Measured Eγ, $\gamma\gamma$ using Gammasphere of 102 Compton-suppressed Ge detectors. Others of the same group 2003HA49,2001YA06.

2002Sm10: Measured lifetimes by differential-plunger method using the EUROBALL and SAPHIR array consisting of 48 square solar cells.

Other papers : 2005Sm08, 2004Sm04; 2003Hu07, 2002Ha46 2002Pa14, 2002Sm10, 2001Kr13. Some of these papers report lifetime and g factor measurements.

Older papers: 1986MA22,1970CH11,1972WI15, 1970WA05, 1970HOZJ, 1971SH12, 1972HO08.

Measured: K x ray, K x ray-γ, γ(t) (1970Ch11,1986Ma22), $\gamma(\theta)$ (1972Wi15).

Assignment: (fragment)(fragment)(K x ray)(γ)-coin.

All data are from 2006JO05 unless otherwise noted.

^{104}Mo Levels

E(level)[†]	J^{π}	$T_{1/2}$[‡]	Comments
0.0[#]	0^+		
192.4[#] *2*	2^+	0.97 ns *8*	g=+0.27 *2* (2004Sm04,2005Sm08); g=+0.248 *22* (2002Pa14) Q(transition)=3.35 *14* (2002Sm10). $T_{1/2}$: other: 0.91 ns *3* (1974JaZN). g factor from integral PAC technique (2004Sm04,2005Sm08,2002Pa14).
561.0[#] *3*	4^+	26.1 ps *8*	Q(transition)=3.35 *5* (2002Sm10). $T_{1/2}$: others: 28.4 ps *24* (2003Hu07), 26.6 ps *35* (1986Ma22).
812.1[@] *2*	2^+		
1027.9[@] *3*	3^+		
1080.4[#] *3*	6^+	4.73 ps *15*	Q(transition)=3.18 *5* (2002Sm10). $T_{1/2}$: others: 4.2 ps *6* (2003Hu07), 4.2 ps *16* (2001Kr13).
1214.8[@] *3*	4^+		
1474.7[@] *3*	5^+		
1583.4[&] *3*	4^+		
1721.9[#] *4*	8^+	2.21 ps *11*	Q(transition)=2.68 *7* (2002Sm10).
1725.0[@] *3*	6^+		
1824.1[&] *3*	5^+		
1884.2[b] *4*	(5^-)		
2036.7[@] *4*	7^+		
2060.8[a] *3*	(4^-)		
2083.8[&] *3*	6^+		
2180.2[c] *4*	(6^+)		
2212.6[a] *3*	(5^-)		
2306.0[b] *4*	(7^-)		
2326.8[@] *4*	(8^+)		
2373.3[&] *3*	(7^+)		
2396.6[a] *3*	(6^-)		
2455.9[#] *4*	10^+	1.08 ps *7*	Q(transition)=2.71 *9* (2002Sm10).
2612.2[a] *3*	(7^-)		
2656.0 *3*			
2682.8[@] *4*	(9^+)		
2685.4[&] *4*	(8^+)		

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^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06 (continued)

^{104}Mo Levels (continued)

E(level)[†]	Jπ	Comments
2706.9[c] 4	(8+)	
2862.2 5		
2865.0[a] 4	(8−)	Transition shown to 2455.9, 10+ level (2003Ha49), but with an incorrect energy value.
2866.9[b] 4	(9−)	
3005.6[@] 4	(10+)	
3011.0[&] 5	(9+)	
3131.5 5		
3149.2?[a] 4	(9−)	E(level): level from 2001Ya06 and 2003Ha49 only.
3255.4[#] 5	12+	
3358.4[c] 4	(10+)	
3396.5[@] 4	(11+)	
3554.7[b] 5	(11−)	
3701.6 6		
3766.0[@] 5	(12+)	
4115.5[c] 5	(12+)	
4115.8[#] 6	14+	
4183.6[@] 5	(13+)	
4356.0[b] 6	(13−)	
4627.7[@] 6	(14+)	
5060.9[#] 7	(16+)	

[†] From least-squares fit to Eγ's, assuming Δ(Eγ)=0.3 keV for each γ ray.
[‡] From 2002Sm10, unless otherwise noted.
[#] Band(A): g.s. Band.
[@] Band(B): γ band.
[&] Band(C): Band based on 4+.
[a] Band(D): Band based on (4−).
[b] Band(E): Band based on (5−).
[c] Band(F): Band based on (6+).

γ(^{104}Mo)

Eγ	Ei(level)	J_i^π	Ef	J_f^π	Comments
151.8	2212.6	(5−)	2060.8	(4−)	
184.0	2396.6	(6−)	2212.6	(5−)	
186.9	1214.8	4+	1027.9	3+	
192.4	192.4	2+	0.0	0+	
206.2	2862.2		2656.0		Eγ: 200.1 (2003Ha49).
215.6	2612.2	(7−)	2396.6	(6−)	
215.8	1027.9	3+	812.1	2+	
236.7	2060.8	(4−)	1824.1	5+	
240.7	1824.1	5+	1583.4	4+	
250.3	1725.0	6+	1474.7	5+	
252.8	2865.0	(8−)	2612.2	(7−)	
259.7	2083.8	6+	1824.1	5+	
259.9	1474.7	5+	1214.8	4+	
284.2[†‡]	3149.2?	(9−)	2865.0	(8−)	

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^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06 (continued)

γ(^{104}Mo) (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
289.5	2373.3	(7^+)	2083.8	6^+	
312.1†‡	2685.4	(8^+)	2373.3	(7^+)	
335.8	2396.6	(6^-)	2060.8	(4^-)	
349.4	1824.1	5^+	1474.7	5^+	
358.8	2083.8	6^+	1725.0	6^+	
368.6	561.0	4^+	192.4	2^+	
368.6	1583.4	4^+	1214.8	4^+	
388.5	2212.6	(5^-)	1824.1	5^+	
394.3	1474.7	5^+	1080.4	6^+	
399.6	2612.2	(7^-)	2212.6	(5^-)	
402.7	1214.8	4^+	812.1	2^+	
421.8	2306.0	(7^-)	1884.2	(5^-)	
443.4	2656.0		2212.6	(5^-)	
446.8	1474.7	5^+	1027.9	3^+	
466.9	1027.9	3^+	561.0	4^+	
468.4	2865.0	(8^-)	2396.6	(6^-)	
477.4	2060.8	(4^-)	1583.4	4^+	
500.4	2083.8	6^+	1583.4	4^+	
510.2	1725.0	6^+	1214.8	4^+	
519.4	1080.4	6^+	561.0	4^+	
526.7	2706.9	(8^+)	2180.2	(6^+)	
528.4	2612.2	(7^-)	2083.8	6^+	
537.0†‡	3149.2?	(9^-)	2612.2	(7^-)	
549.2	2373.3	(7^+)	1824.1	5^+	
555.5	1583.4	4^+	1027.9	3^+	
560.9	2866.9	(9^-)	2306.0	(7^-)	
562.0	2036.7	7^+	1474.7	5^+	
570.1	3701.6		3131.5		
572.5	2396.6	(6^-)	1824.1	5^+	
584.1	2306.0	(7^-)	1721.9	8^+	
595.2	2656.0		2060.8	(4^-)	
601.6	2685.4	(8^+)	2083.8	6^+	
601.8	2326.8	(8^+)	1725.0	6^+	
604.9	2326.8	(8^+)	1721.9	8^+	
609.1	2083.8	6^+	1474.7	5^+	
609.3	1824.1	5^+	1214.8	4^+	
619.7	812.1	2^+	192.4	2^+	
629.2	2212.6	(5^-)	1583.4	4^+	
637.7	3011.0	(9^+)	2373.3	(7^+)	
641.5	1721.9	8^+	1080.4	6^+	
644.6	1725.0	6^+	1080.4	6^+	
646.1	2682.8	(9^+)	2036.7	7^+	
651.5	3358.4	(10^+)	2706.9	(8^+)	
653.8	1214.8	4^+	561.0	4^+	
678.8	3005.6	(10^+)	2326.8	(8^+)	
687.8	3554.7	(11^-)	2866.9	(9^-)	E_γ: 689.0 (2003Ha49).
713.7	3396.5	(11^+)	2682.8	(9^+)	
734.0	2455.9	10^+	1721.9	8^+	
757.1	4115.5	(12^+)	3358.4	(10^+)	
760.4	3766.0	(12^+)	3005.6	(10^+)	E_γ: 747.7 in 2001Ya06 and 2003Ha49.
771.3	1583.4	4^+	812.1	2^+	
787.1	4183.6	(13^+)	3396.5	(11^+)	E_γ: 767.3 in 2001Ya06, 772.3 in 2003Ha49.
796.2	1824.1	5^+	1027.9	3^+	
799.5	3255.4	12^+	2455.9	10^+	
801.3	4356.0	(13^-)	3554.7	(11^-)	E_γ: 802.7 (2003Ha49).

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^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06 (continued)

$\gamma(^{104}Mo)$ (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	E_γ	E_i(level)	J_i^π	E_f	J_f^π
803.8	1884.2	(5^-)	1080.4	6^+	1022.4	1214.8	4^+	192.4	2^+
812.1	812.1	2^+	0.0	0^+	1022.4	1583.4	4^+	561.0	4^+
835.5	1027.9	3^+	192.4	2^+	1032.9	2060.8	(4^-)	1027.9	3^+
860.4	4115.8	14^+	3255.4	12^+	1099.8	2180.2	(6^+)	1080.4	6^+
861.7	4627.7	(14^+)	3766.0	(12^+)	1145.0	2866.9	(9^-)	1721.9	8^+
869.0	2083.8	6^+	1214.8	4^+	1164.0	1725.0	6^+	561.0	4^+
898.6	2373.3	(7^+)	1474.7	5^+	1225.6	2306.0	(7^-)	1080.4	6^+
902.5	3358.4	(10^+)	2455.9	10^+	1246.4	2326.8	(8^+)	1080.4	6^+
913.7	1474.7	5^+	561.0	4^+	1283.7	3005.6	(10^+)	1721.9	8^+
921.9	2396.6	(6^-)	1474.7	5^+	1323.2	1884.2	(5^-)	561.0	4^+
940.6	3396.5	(11^+)	2455.9	10^+	1391.0	1583.4	4^+	192.4	2^+
945.1	5060.9	(16^+)	4115.8	14^+	1409.6	3131.5		1721.9	8^+
956.3	2036.7	7^+	1080.4	6^+	1619.2	2180.2	(6^+)	561.0	4^+
960.9	2682.8	(9^+)	1721.9	8^+	1626.5	2706.9	(8^+)	1080.4	6^+
985.0	2706.9	(8^+)	1721.9	8^+	1628.1	2656.0		1027.9	3^+
997.9	2212.6	(5^-)	1214.8	4^+	1636.5	3358.4	(10^+)	1721.9	8^+

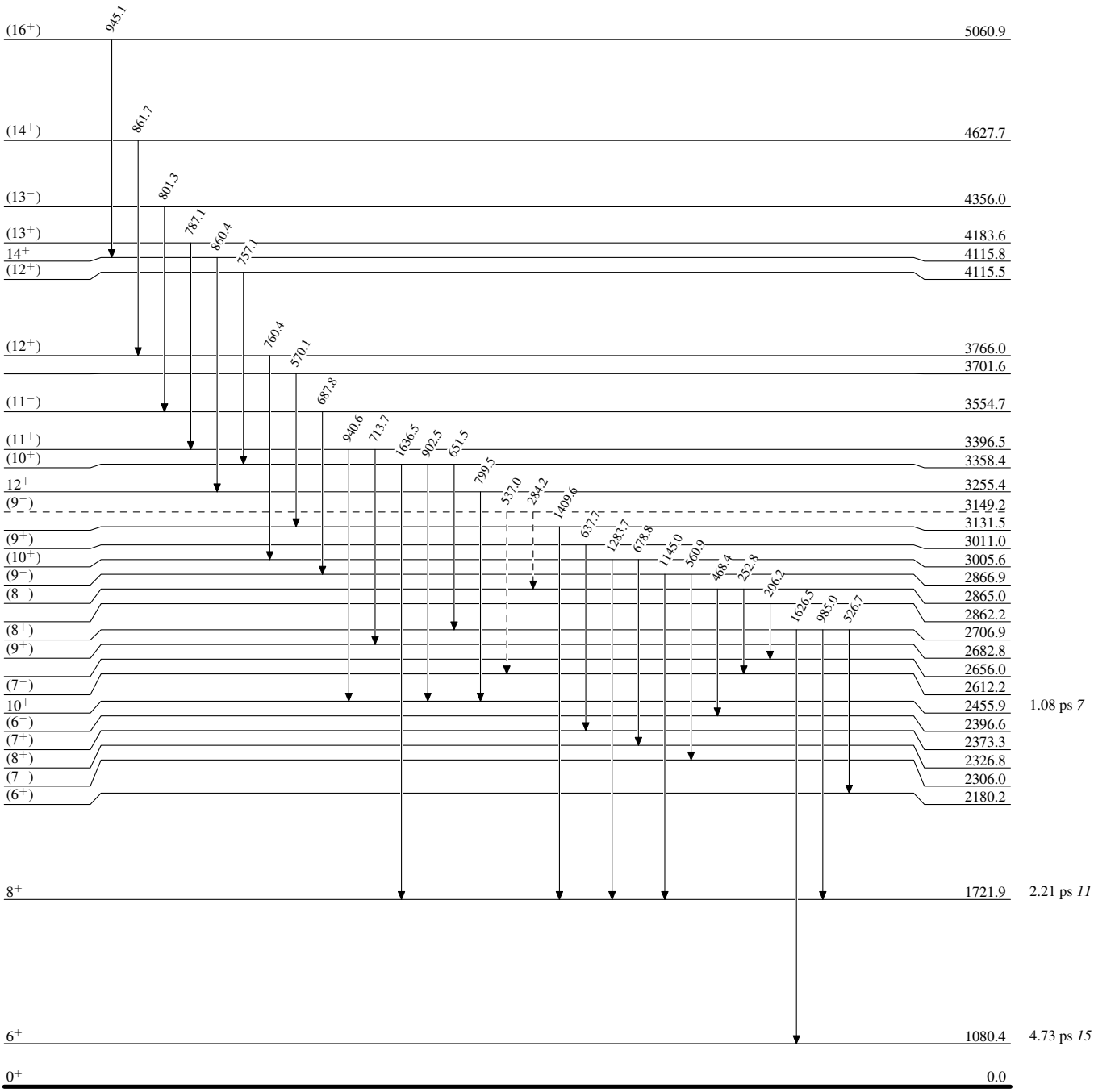
† From 2001Ya06 and 2003Ha49 only.
‡ Placement of transition in the level scheme is uncertain.

Legend

^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06

Level Scheme

- - - - - - ► γ Decay (Uncertain)



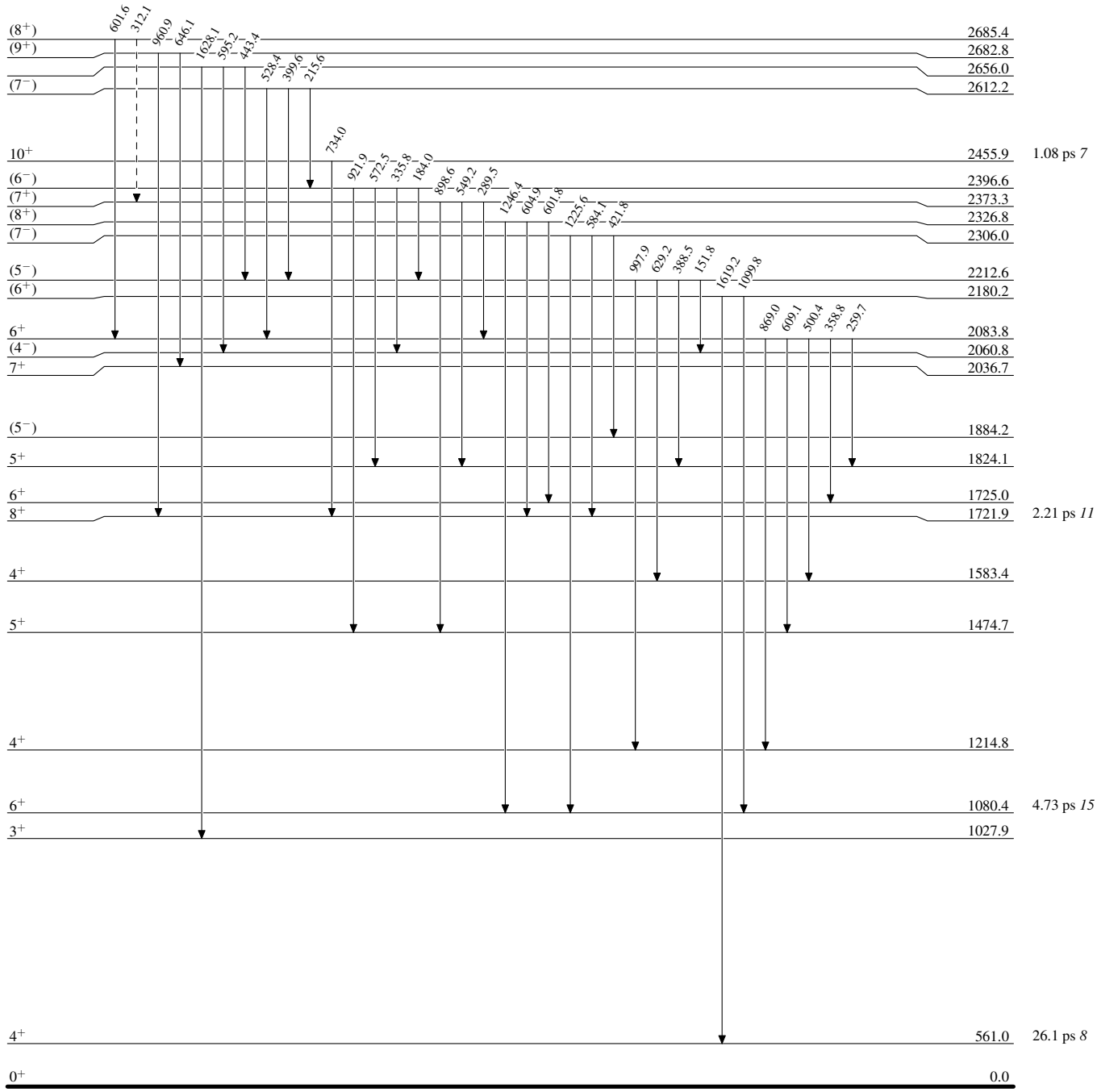
$^{104}_{42}Mo_{62}$

Legend

^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06

Level Scheme (continued)

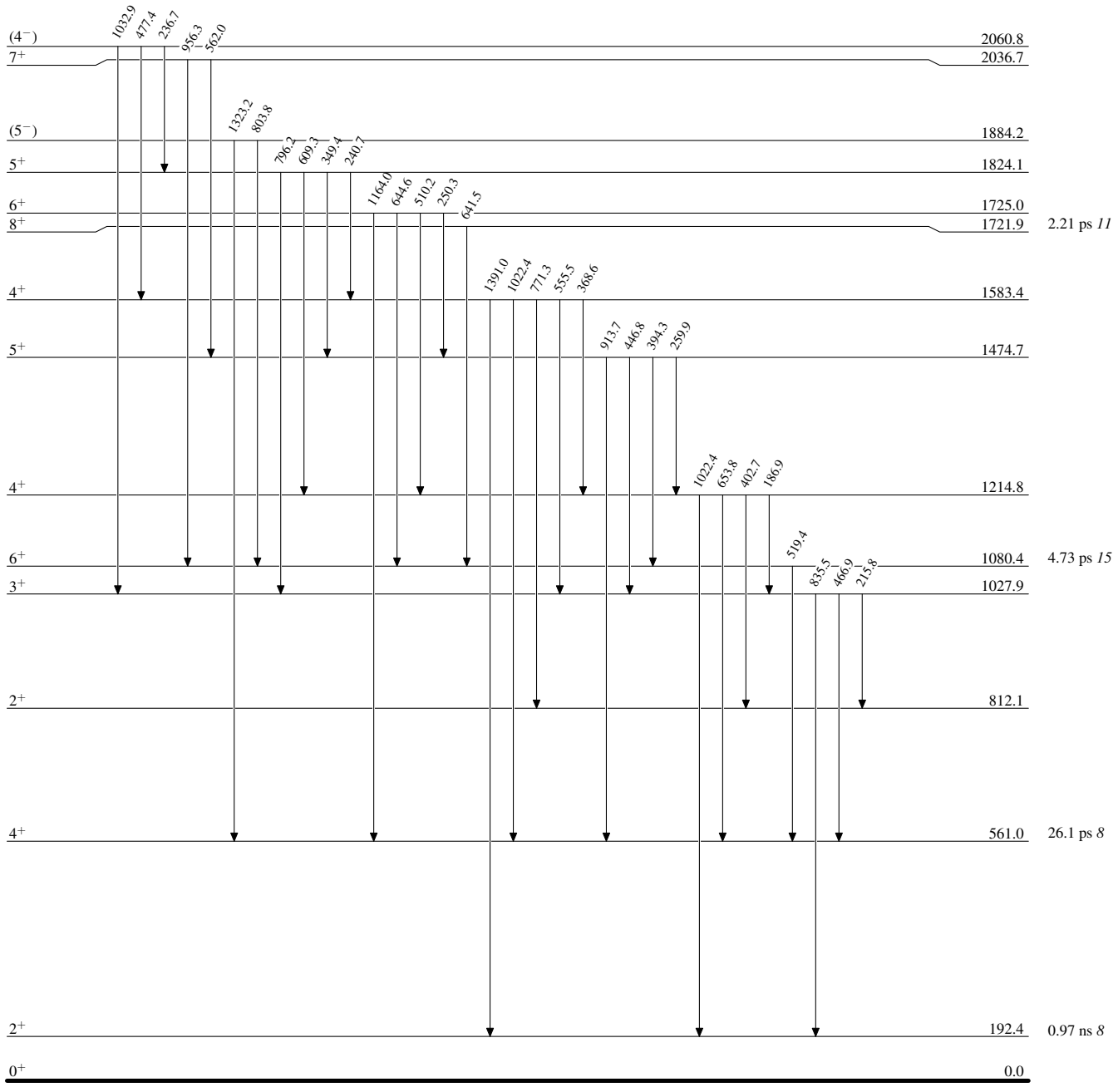
- - - - - - ► γ Decay (Uncertain)



$^{104}_{42}Mo_{62}$

^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06

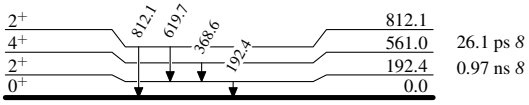
Level Scheme (continued)



$^{104}_{42}Mo_{62}$

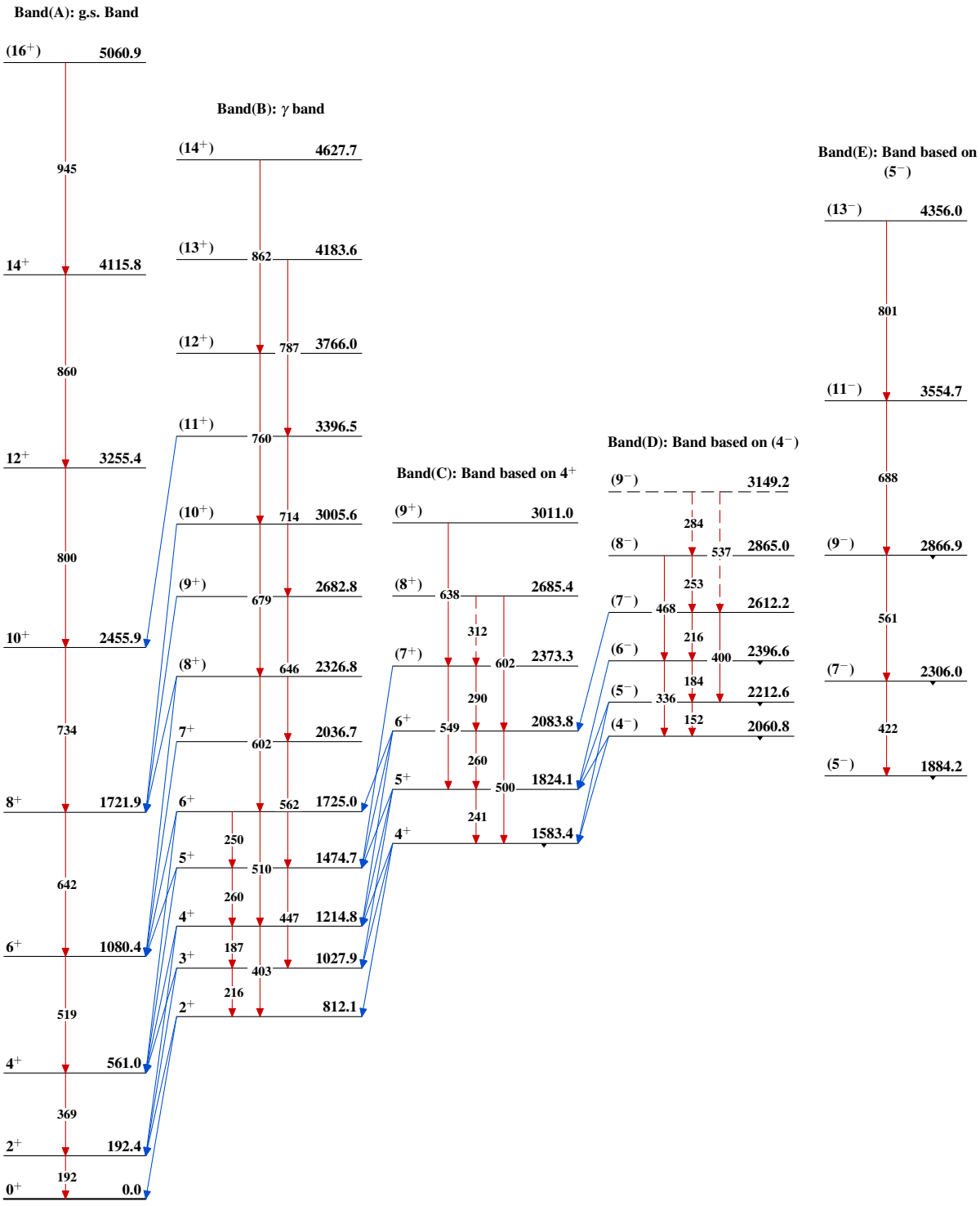
^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06

Level Scheme (continued)



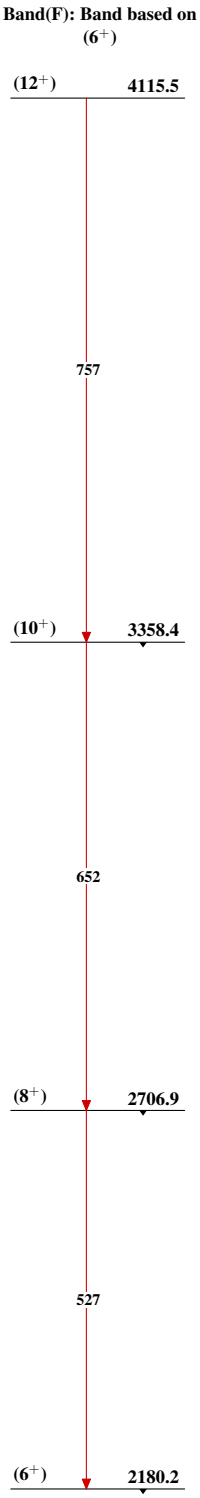
$^{104}_{42}Mo_{62}$

^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06



$^{104}_{42}Mo_{62}$

^{252}Cf SF decay 2006Jo05,2003Ha49,2001Ya06 (continued)



$^{104}_{42}Mo_{62}$